



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,797	02/12/2004	Steve Pronovost	MSFT-2865/304048.02	5844

41505 7590 01/25/2008
WOODCOCK WASHBURN LLP (MICROSOFT CORPORATION)
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER

KAWSAR, ABDULLAH AL

ART UNIT	PAPER NUMBER
----------	--------------

2195

MAIL DATE	DELIVERY MODE
-----------	---------------

01/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/777,797

Applicant(s)

PRONOVOST ET AL.

Examiner

Abdullah-Al Kawsar

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02/12/2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3. Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :03/29/2004, 04/09/2007, 06/26/2007.

DETAILED ACTION

1. Claims 1-45 are pending.

Specification

2. The disclosure is objected to because of the following informalities: on page 14, paragraph 37 and 38 should be one paragraph.

Appropriate correction is required.

Drawings

3. The drawings are objected to because fig. 8 and 10 have shaded portion that are not clear after scanning. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 7, 24 and 38 are objected to because of the following informalities: spell out the first instance of "GPU". Appropriate correction is required.

Information Disclosure Statement

5. The information disclosure statement filed 04/09/2007 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 15-31 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

8. As per claim 15, the claimed computer executable instructions are software per se, as they are not tangibly stored in any sort of physical medium. To overcome this type of 101 rejections the claim need to be amended to include statutory storage device.

9. As per claims 16-31, the claim is directed to signal carrying instruction or a computer device comprising means which is a non-statutory entity since it does not fit one of the statutory category of inventions. The device is software per se and the signal is a form of energy. Claims 18-31 are similar to claim 17.

10. Claims 18-31 are directed to computing device and not the computer system and computing device combination and is non-statutory as software per se since all the components of the device is software. Appropriate correction required.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The following claim languages are not clearly understood:

i. Claim 1, line 4 recites "coprocessor resources" it is unclear what is meant by that (i.e. where located? What included in coprocessor resources? Line 5

recites "a kernel mode" it is unclear if it is the same kernel driver mentioned before (i.e. the kernel mode?). Line 9 it is unclear what is meant by "analyzing" (i.e. how it is being analyzed? What is the base for analyze?). It is unclear what is the relationship between "at least one memory resource" on line 6 and "paging DMA buffer" on line 9 (i.e. is it the same memory resource?). Line 10 recite "instructs" it is unclear what is meant by that (i.e. access? Update?) Line 12 recites "processing" it is unclear what is being processed (i.e. content of the DMA buffer? the resource request?).

ii. Claims 18 and 32 has similar deficiencies of claim 1 above.

13. Claims 32-45 are rejected under 35 U.S.C. 112, second paragraph for antecedent basis. Claim 32 is a method claim directed to computer system/device. Examiner is interpreting claim 32 as system/device claim as the dependent claims 33-45 are directed to computer device claims. Claims do not comply with 35 U.S.C. 112, sixth paragraph also. Appropriate correction is required.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. Claims 1-45 are rejected under 35 U.S.C. 102 (e) as being anticipated by Wilt et al. (Wilt) US Patent No. 7234144.

16. As per claim 1, Wilt teaches the invention as claimed including a method for scheduling at least one resource of a coprocessor in a computing system having a processor and a coprocessor (abstract, lines 1-3), comprising:

receiving by a kernel mode driver a command buffer from a user mode driver, wherein the command buffer is formulated based on a request for coprocessor resources (col 23, lines 62-65; col 25, lines 29-34);

generating by a kernel mode driver at least one direct memory access (DMA) buffer based on said command buffer and a resource list corresponding to at least one memory resource associated with processing said at least one DMA buffer by said coprocessor, wherein a set of at least one DMA buffer is maintained for each client context (col 25, lines 10-14; col 24, lines 57-61);

analyzing said resource list, and based on said analyzing, generating a paging DMA buffer including at least one instruction that instructs the coprocessor with respect to the at least one memory resource (col 24, lines 34-43; lines 57-61; col 25, lines 29-34); and

submitting said at least one DMA buffer to said coprocessor for processing (col 14, lines 42-46).

17. As per claim 2, Wilt teaches the set of at least one DMA buffer is a software queue maintained for each application submitting requests for coprocessor resources (col 15, lines 44-47).

18. As per claim 3, Wilt teaches transmitting said at least one instruction to the coprocessor (col 14, lines 31-34).

19. As per claim 4, Wilt teaches submitting includes submitting said paging buffer to the coprocessor (col 18, lines 4-6).

20. As per claim 5, Wilt teaches generating includes assigning priority to elements in the at least one DMA buffer (col 18, lines 8-11).

21. As per claim 6, Wilt teaches paging buffer includes at least one command that requests the coprocessor to stop processing (col 29, lines 17-29).

22. As per claim 7, Wilt teaches at least one command is a fence that generates an interrupt and stalls the GPU (col 29, lines 30-40).

23. As per claim 8, Wilt teaches patching at least one reference to the at least one memory resource with actual memory resource data (col 24, lines 65-67 through col 25, lines 1-9).

24. As per claim 9, Wilt teaches coprocessor processes said at least one DMA buffer in a different order than the order in which said at least one DMA buffer is generated (col 25, lines 4-9).
25. As per claim 10, Wilt teaches coprocessor is busy processing another DMA buffer during at least one of said receiving, generating, analyzing and submitting (col 19, lines 30-33).
26. As per claim 11, Wilt teaches interrupting the processing of a DMA buffer submitted to the coprocessor according to said submitting (col 19, lines 41-43); and
resuming processing of the interrupted DMA buffer (col 19, lines 44-50).
27. As per claim 12, Wilt teaches analyzing includes determining whether said at least one DMA buffer implicates a threshold amount of memory resources (col 24, lines 4-14).
28. As per claim 13, Wilt teaches if said at least one DMA buffer implicates more than the threshold amount, splitting said at least one DMA buffer (col 24, lines 4-14).
29. As per claim 14, Wilt teaches at least one instruction includes at least one of an evict, page in and relocate instruction (col 19, lines 41-55).

30. As per claim 15, Wilt teaches an application programming interface comprising computer executable modules having computer executable instructions for carrying out the method of claim 1 (col 32, lines 6-11).

31. As per claim 16, Wilt teaches a computing device comprising means for carrying out the method of claim 1 (col 3, lines 50-54).

32. As per claim 17, Wilt teaches a modulated data signal carrying computer executable instructions for performing the method of claim 1 (col 10, lines 58-65).

33. As per claims 18-31 and 32-45, they have similar limitations as of claims 1-14 above. Therefore, they are rejected under the same rationale as of claims 1-14 above.

Conclusion

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ober et al. (US Patent No. 6708273); Kaplan et al. (US Patent No. 6704871);

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdullah-Al Kawsar whose telephone number is 571-270-3169. The examiner can normally be reached on 7:30am to 5:00pm, EST.

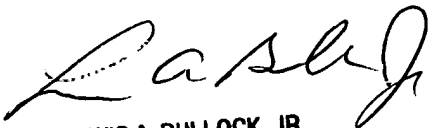
Application/Control Number:
10/777,797
Art Unit: 2195

Page 10

36. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng Ai T. An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

37. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Abdullah Al Kawsar
Patent Examiner
Art Unit 2195.


LEWIS A. BULLOCK, JR.
PRIMARY EXAMINER